

(12) United States Patent

Taagepera

(54) NON-WELDING APPARATUS FOR REPAIR OF AN ENCLOSURE WALL AND METHODS FOR USE THEREOF

(71) Applicant: Chevron U.S.A. Inc., San Ramon, CA

(US)

Inventor: Jaan Taagepera, Benicia, CA (US) (72)

Assignee: CHEVRON U.S.A. INC., San Ramon,

CA (US)

Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35

U.S.C. 154(b) by 0 days.

(21)Appl. No.: 14/613,051

(22)Filed: Feb. 3, 2015

(65)**Prior Publication Data**

> US 2016/0221129 A1 Aug. 4, 2016

(51) Int. Cl. B29C 73/00 (2006.01)B32B 43/00 (2006.01)

(Continued)

(52) U.S. Cl. CPC **B23P 6/00** (2013.01); B29C 65/48 (2013.01); B29C 65/542 (2013.01); (Continued)

(58) Field of Classification Search

CPC Y10T 428/20; Y10T 152/10891; Y10T 152/10882; Y10T 152/109; Y10T 152/10909; B29C 73/04; B29C 73/06; B29C 73/08; B29C 73/10; B29C 73/12; B29C 65/48; B29C 65/524; B29C 65/54; B29C 65/542; B29C 65/56; B29C 65/561; B29C 65/72; B29C 66/474; F16L 55/1612; F16L 55/162; F16L 55/1645; F16L 55/16455; F16L 55/168; F16L 55/1683; B32B 2556/00

US 9,636,787 B2 (10) Patent No.: (45) Date of Patent: May 2, 2017

USPC 156/60, 91, 92, 94, 98, 228, 242, 245, 156/292, 293, 294, 297, 298, 303.1, 305, 156/349, 381, 391, 423, 97; 138/97, 98, (Continued)

References Cited (56)

U.S. PATENT DOCUMENTS

29/402.1	00
3,236,407 A * 2/1966 Zelman B23P 6/0	_
138/9	9

(Continued)

FOREIGN PATENT DOCUMENTS

JP	07119885	Α	5/1995
JP	09030595	A	2/1997

Primary Examiner — Philip Tucker Assistant Examiner — Brian R Slawski (74) Attorney, Agent, or Firm — Karen R. DiDomenicis

ABSTRACT (57)

Disclosed is a mechanical clamp useful for repairing localized damage in the wall of an enclosure such as a pressure vessel. The mechanical clamp is an apparatus having a cap having a convex side and a concave side wherein the concave side is adapted for positioning adjacent the wall of the enclosure. The apparatus further includes at least one rod attached securely in the cap for passing through at least one hole in the wall of the enclosure wherein each rod has a first end attached securely in the cap and a second end and each rod is threaded along a portion of the rod including the second end. The apparatus further includes a nut for attaching to the second end of each rod for securing the cap in place adjacent to the wall of the enclosure. Methods for applying the mechanical clamp are also disclosed.

5 Claims, 4 Drawing Sheets

